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PATENT SPECIFICATION

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431,416

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Complete Specification Accepted: July 8, 1935.



PROVISIONAL SPECIFICATION

Improvements in Kinematograph Projectors

I, REGINALD HOWARD CRICKS, of 159, Wardour Street, London, W. 1, a British subject, do hereby declare the nature of this invention to be as follows:—

- 5 In the projection of kinematograph films by means of a powerful illuminant, the intense heat impinging upon the film gate not only increases the risks of firing of the film, but also causes the film to buckle or curl laterally, resulting in the centre of the projected picture appearing out of focus on the screen. The object of the present invention is to eliminate these faults, first by materially reducing the temperature of the gate, and secondly by constructing it in such a fashion as to minimise film buckle.

- 10 It has been proposed to direct a current of air upon the gate by forming the blades of the flicker shutter (preferably placed between the gate and the illuminant) in the form of a fan; normally however this construction causes any dirt which may be in the atmosphere to be drawn upon the film, resulting in film damage. According to the present invention, a shutter of this type is employed, but is enclosed within a housing, to which air can be admitted only through a ducting communicating with a suitable air cleansing filter.

- 15 In a preferred construction, a shutter of the drum type is used the circular face of which is provided with radially or angularly disposed projections and apertures serving as fan blades, and drawing the purified air into the interior portion of the shutter, whence by centrifugal force, aided by the construction of the cylindrical obturating blades in the form of a turbine or centrifugal fan, the

air is expelled in the direction of the film aperture, thus causing a steady current of air to impinge upon the film.

The light beam may be still further cooled by the interposition between illuminant and gate, and within the shutter housing, of a plurality of heat shields, of which two may be formed as an arcuate member disposed concentrically with the shutter, two diametrically opposite apertures allowing the passage of light to the film. A portion of the air current is led round the said arcuate member, and expelled at the rear of the shutter housing; the said arcuate member may be finned to increase the heat radiating surface. A third heat-shield placed between the illuminant and the shutter may be designed to prevent the admission of air into the shutter housing other than the filter.

The housing enclosing the above-described device may conveniently be formed of D-shape, the lastmentioned heat shield forming the straight portion and the film gate being formed on the curved portion; in order to minimise film buckle, the gate may itself be curved as to part of its length.

Any suitable type of air filter may be employed, as for example the so-called viscous type, in which the air stream is drawn over surfaces coated with an adhesive substance, such as oil or glycerine; such a filter may be conveniently accommodated in the projector mechanism, and may be arranged to be easily removable for cleaning purposes.

Dated the 23rd day of February, 1934.
R. H. CRICKS.

COMPLETE SPECIFICATION

Improvements in Kinematograph Projectors

- 80 I, REGINALD HOWARD CRICKS, of 159, Wardour Street, London, W. 1, a British subject, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

In the projection of kinematograph [Price 1/-]

films by means of a powerful illuminant, the intense heat impinging upon the film gate not only increases the risks of firing of the film, but also causes the film to buckle or curl laterally, resulting in the centre of the projected picture appearing out of focus on the screen. The object of the present invention is to eliminate

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these faults, first by materially reducing the temperature of the gate, and secondly by constituting it in such a fashion as to minimise film buckle.

5 It has been proposed to direct a current of air upon the gate by forming the blades of the flicker shutter (preferably placed between the gate and the illuminant) in the form of a fan; normally however this construction causes
10 any dirt which may be in the atmosphere to be drawn upon the film, resulting in film damage. In one such known construction, a shutter having fan blades
15 formed upon it is caused to feed air through the casing containing the whole of the projector mechanism, such air being drawn into the casing through screened openings.

20 According to the present invention, a shutter of this type is employed, but is itself enclosed within a housing adjacent to the film gate, and distinct from the mechanism casing, to which air can be
25 admitted only through a suitable air cleansing filter, the air stream being directed by the shutter and associated parts upon the film gate.

30 The invention further provides for the use of a film gate curved in a longitudinal direction for part of its length, for the purpose of reducing lateral buckle of the film; and also for the interposition between the illuminant and the film
35 of a plurality of heat-shields.

40 The invention can be realised with any type of shutter, as for example a disc shutter disposed between the illuminant and the film. A preferred construction embodying a so-called drum shutter is shown in the appended drawings, of which—

45 Fig. 1 is a view of the operating side of a projector embodying the invention, omitting certain components extraneous to the invention.

Fig. 2 is a perspective view of the shutter.

50 Fig. 3 is a perspective view of a heat shield.

Fig. 4 is a perspective view of the air filter.

Referring now to Fig. 1, 1 is the main casting of the projector, upon which is
55 formed or applied a housing 2. Upon the forward face of the said housing is formed a film channel 3, the upper portion of which is curved. The film is fed in the usual fashion by means of a top sprocket 4, an intermittent sprocket 5, and a take-up sprocket 6, tension being applied to the film in the channel 3 by means of a gate 7, carrying friction skates 8 pressed by springs 9 upon the curved
65 portion of the gate, and skates 10 pressed

by springs 11 upon the flat portion of the gate. The gate 7 moves upon horizontal slides 12, 13, for threading the film, and is opened by means of a lever 14 and closed by means of a spring 15, acting upon an extension 16 of the said gate. The film picture is illuminated through an aperture 17.

70 Within the housing 2 is contained a drum shutter 18, adapted to draw air into the housing 2 through an aperture 19 in its rear wall. The said shutter (which in Fig. 1 rotates in a clockwise direction) is shown in greater detail in Fig. 2, and consists of a circular member 20
80 having formed upon it radially or angularly disposed projections and apertures 21; and cylindrical obturating members 22, having formed upon them projections and apertures 23. The function of the said projections and apertures 21, 23, is to draw a current of air within the interior of the shutter, and to expel it by centrifugal force in the direction of the film aperture, thus causing a steady current of air to impinge upon the film.

85 The heat shields above referred to comprise a rear member 24, an extension 24^a of which enters the housing 2; and an arcuate member 25, which is mounted upon, but thermally insulated from, a side plate (not shown) which seals the face of the housing 2. The said member 25, shown in greater detail in Fig. 3, is provided with two apertures 26, 27, through which the beam of light passes to the film. Its upper edge 28 is so formed as to act as a scoop for the air supply, directing it upon the gate; while its periphery is formed with heat-radiating fins 29, around which the current of air is led and afterwards expelled through the aperture in the heat shield 24.

90 An automatic safety shutter 30 is mounted concentrically with the shutter 18, and is caused by any known means, as for example oil-covered friction discs carried on the shaft of the shutter 18, to make a partial rotation in a clockwise direction about the axes of the shutter 18 when the shutter attains a certain velocity. In the position shown, it serves to cut off the light and heat from the gate, until the machine attains speed; when it lifts (as shown in broken lines) a fillet 31 engages with the extension 24^a of the heat shield 24, and prevents the admission of air through the aperture 24, while the blade of the safety shutter assists in directing the stream of air towards the gate by partially enclosing the upper portion of the shutter 18.

120 The aperture 19 communicates through a duct 32 with a filter housing 33, formed on the farther side of the main casting 1.
130

within which is contained a filter, conveniently of the so-called viscous type, as shown in Fig. 4. The said filter is adapted to fit closely within the housing 5 35, and is removable for cleaning purposes; it comprises a flat plate 36, upon which are affixed a plurality of inclined vanes 37, which are covered with an adhesive substance such as oil, grease, or glycerine. Air is admitted through a grille 38, is cleansed by impinging upon the vanes 37, and is drawn through the duct 34 to the interior of the shutter 18, whence it is directed upon the gate as 15 hereinbefore described.

Having now particularly described and ascertained the nature of my said invention, and in what manner the same is to be performed, I declare that what I 20 claim is:—

1. In a cinematograph projector the obturating shutter of which is formed with fan blades for the purpose of directing a current of air upon the film gate, 25 the enclosure of the said shutter within a housing adjacent to the film gate, and distinct from the mechanism casing, to which air is admitted through a cleansing filter.

30 2. In a cinematograph projector according to the preceding claiming

clause, the use of a drum shutter, placed between the illuminant and the gate, and having fan blades formed upon either or both of its circular and cylindrical 35 faces.

3. In a cinematograph projector according to either of the preceding claiming clauses, the use of an air filter 40 of the viscous type, in which air is drawn over surfaces coated with an adhesive substance.

4. In a cinematograph projector according to any of the preceding claiming clauses, the interposition between 45 illuminant and film of a plurality of apertured heat shields, some or all of which may be cooled by the current of air produced by the shutter.

5. In a cinematograph projector 50 according to any of the preceding claiming clauses, the use of a gate longitudinally curved as to part of its length, for the purpose of reducing lateral buckle of the film. 55

6. In a cinematograph projector, the use of an obturating shutter, shutter housing, cleansing filter, heat shields, and gate, constructed and functioning 60 substantially as hereinbefore described.

Dated this 20th day of February, 1935.

R. H. CRICKS.

[This Drawing is a reproduction of the Original on a reduced scale.]

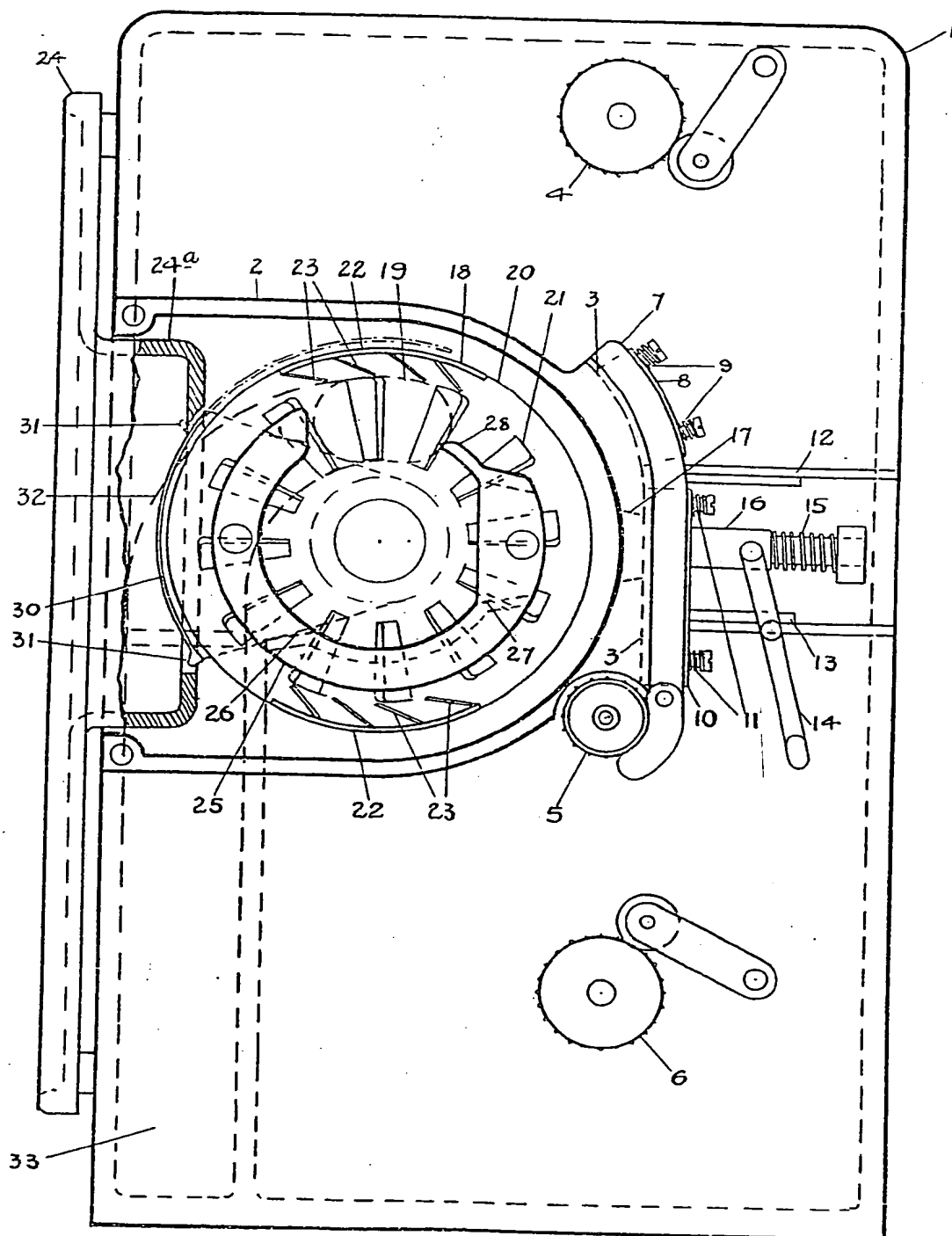


FIG. 1

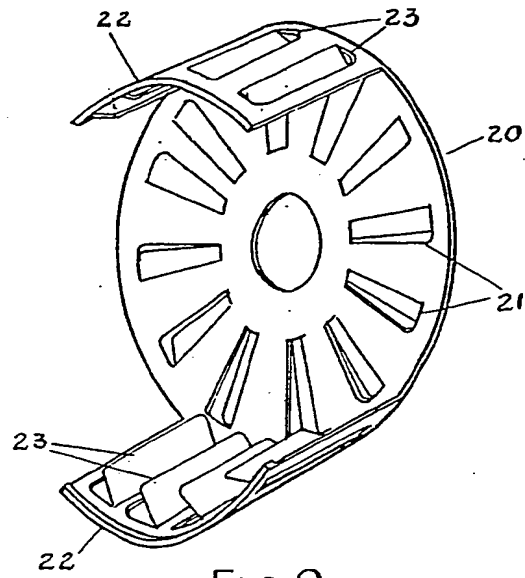
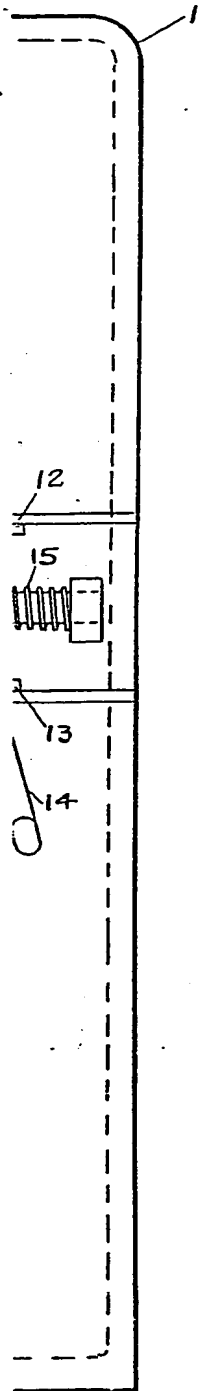


FIG. 2

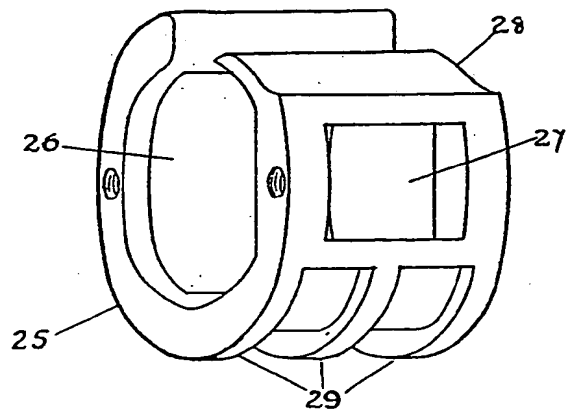


FIG. 3

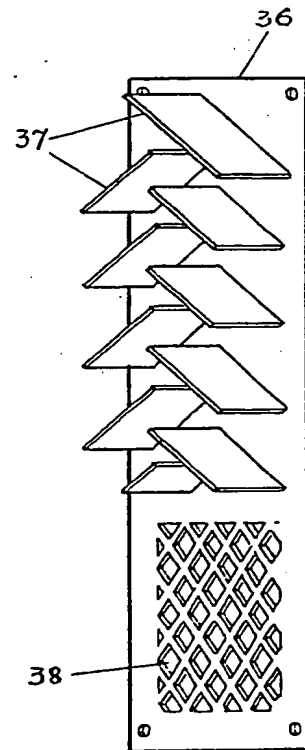


FIG. 4

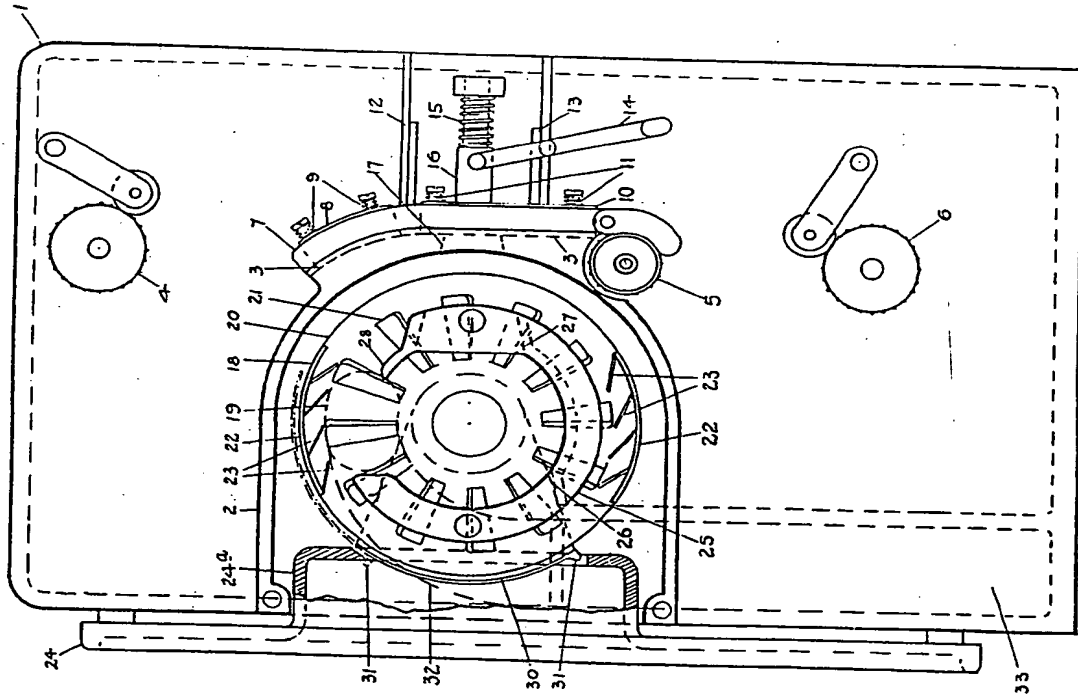


FIG. 1

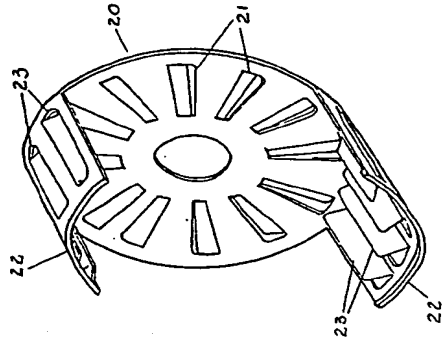


FIG. 2

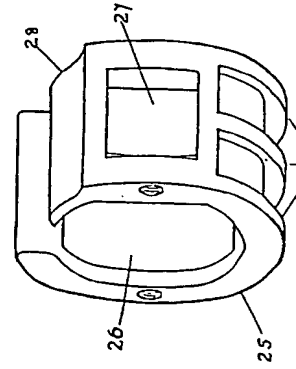


FIG. 3

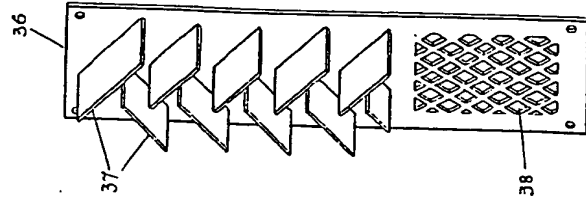


FIG. 4

[This Drawing is a reproduction of the Original on a reduced scale.]